Atlantic Richfield Company

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Appendix 2A

GMS Volume Estimation Information

Appendix 2A – GMS Volume Estimations

Volumetric calculations for the sulfide tailings pile at OU-4b, the South Waste Rock Area (South WRA) in OU-5, and the Vat Leach Tailings (VLT) pile at OU-6 were derived using the Groundwater Modeling System (GMS) software platform. The software may be used to create three-dimensional (3-D) solid conceptual models of the waste materials using topographic data. GMS was used to create topographic models of the ACMS using both current topographic data and a native, pre-mining topographic data set. Using standard data interpolation algorithms, in this case the Inverse Distance Weighted algorithm, GMS was then used to create a virtual solid by 'extruding' a volume between the current topographic surface and the native, pre-mining surface. The boundaries of the extrusion are constrained to the outer boundaries of the waste piles where they intersect the surrounding topographic surface.

Potential uncertainties or error in the volume calculations are introduced based on the precision and accuracy of the current and pre-mining topographic input data. Detailed current topographic surface data for the ACMS was derived from a 2017 topographic survey, which consists of 1-foot contour intervals of the ACMS and surrounding vicinity, referenced to North American Datum of 1927 (horizontal) and National Geodetic Vertical Datum 29 (vertical). The native, pre-mining topographic surface was derived from digitized contours of the 1915 U.S. Geologic Survey, Nevada (Lyon County), Yerington District topographic map. Qualitatively, the 1915 topographic data appear sufficiently accurate for modeling volume estimates as comparative elevations between the two topographic data sets in undisturbed slopes and surfaces west and north of the Site are typically within 3 to 5 feet. A quantitative evaluation of the uncertainty of calculated volumes based on application of a 3-foot variance in the 1915 topographic surface is provided below.

Following is a description of the volume calculations for each of the waste piles in OU-4b, OU-5, and OU-6.

OU-4b – Sulfide Tailings Area

Figure 2A-1 illustrates the topographic expression of the 1915 pre-mining surface beneath the OU-4b sulfides tailings area. The surface was created using the 1915 topographic data as described above augmented with the elevations of native material contacts encountered in six deep borings installed during the 2019-2020 investigation in OU-4b. Borings STSB-01 through STSB-06 were drilled to depths below the sulfide tailing/native material interface and the elevations of the native-material interface encountered in these borings are incorporated into the 1915 topographic data. The elevations of the native-material interface as logged in borings drilled for installation of existing monitoring wells BW-37S and BW-29S were similarly incorporated.

Figure 2A-2 illustrates the solid model of the OU-4b sulfide tailings area. The solid model represents the volume between the current topographic surface and the 1915 pre-mining surface, constrained to the boundaries of the OU-4b sulfide tailings area. The total volume is approximately 1,484,430,000 cubic feet (54,980,000 cubic yards). The volume of the VLT covering the sulfide tailings in OU-4b was calculated independently using a similar process. The elevation of the base of the VLT in OU-4b was recorded in all 35 borings installed during the RI (STSB-01 through STSB-35). These elevations were used to create a separate surface in GMS representing the base of the VLT. A solid model was then created between the current topographic surface and the base of the VLT. It was assumed that the berms bounding the west, north, and east sides of OU-4b comprise VLT and the full volume of the berms (current surface to pre-mine 1915 surface) was incorporated into the VLT volume calculation. The volume of the VLT in OU-4b was determined to be approximately 158,153,000 cubic feet (5,858,000 cubic yards). The volume of the sulfide tailings beneath the VLT cover was determined as the difference between the total OU-4b tailings

pile volume and the volume of the VLT, or approximately 1,326,276,000 cubic feet (49,131,000 cubic yards).

An approximation of the potential error in the total volume calculated for the OU-4b tailings pile was determined by applying a variance in the elevation of the 1915 surface beneath the OU-4b boundary. GMS allows for any surface to be uniformly offset by a specified distance, and a volume to be calculated between the offset and original surface. The 1915 surface beneath the OU-4b tailings pile was offset by 3 feet, with a resulting offset volume of approximately 89,845,000 cubic feet (3,328,000 cubic yards). This represents approximately 6 percent of the total volume calculation for the OU-4b waste pile, and the total volume is thus 1,484,430,000 cubic feet +/- 6%.

OU-5 – South Waste Rock Area

Figure 2A-3 illustrates the topographic expression of the 1915 pre-mining surface beneath the OU-5 South WRA. The surface was created using the 1915 topographic data as described above augmented with the elevations of native material contacts encountered in three deep borings installed during the 2019-2020 investigation in the South WRA. Borings WRSB-206, -207, and -208 were drilled to depths below the waste rock/native material interface and the elevation of the native material interface encountered in these borings are incorporated into the 1915 topographic surface.

Figure 2A-4 illustrates the solid model of the OU-5 South WRA. The solid model represents the volume between the current topographic surface and the 1915 pre-mining surface, constrained to the boundaries of the South WRA. The total volume is approximately 1,974,821,000 cubic feet (73,142,000 cubic yards).

An approximation of the potential error in the total volume calculated for the OU-5 South WRA was determined by applying a variance in the elevation of the 1915 surface beneath the OU-5 South WRA boundary. The 1915 surface beneath the OU-5 South WRA was offset by 3 feet, with a resulting offset volume of 50,433,000 cubic feet (1,868,000 cubic yards). This represents approximately 2.5 percent of the total volume calculation for the OU-5 SWRP, and the total volume is thus 1,974,821,0000 cubic feet +/- 2.5%.

OU-6 – VLT Pile

Figure 2A-5 illustrates the topographic expression of the 1915 pre-mining surface beneath the OU-6 VLT pile. The surface was created using the 1915 topographic data as described above. There were no borings installed during the RI that penetrated the full thickness of the VLT so there are no additional native surface elevation control points beneath the OU-6 VLT pile.

Figure 2A-6 illustrates the solid model of the OU-6 VLT pile. The solid model represents the volume between the current topographic surface and the 1915 pre-mining surface, constrained to the boundaries of the VLT pile. The total volume is approximately 1,323,543,000 cubic feet (49,020,000 cubic yards).

An approximation of the potential error in the total volume calculated for the OU-6 VLT pile was determined by applying a variance in the elevation of the 1915 surface beneath the OU-6 VLT pile boundary. The 1915 surface beneath the OU-6 VLT pile was offset by 3 feet, with a resulting offset volume of 48,214,000 cubic feet (1,786,000 cubic yards). This represents approximately 3.6 percent of the total volume calculation for the OU-6 VLT pile, and the total volume is thus 1,323,543,000 cubic feet +/- 3.6%.

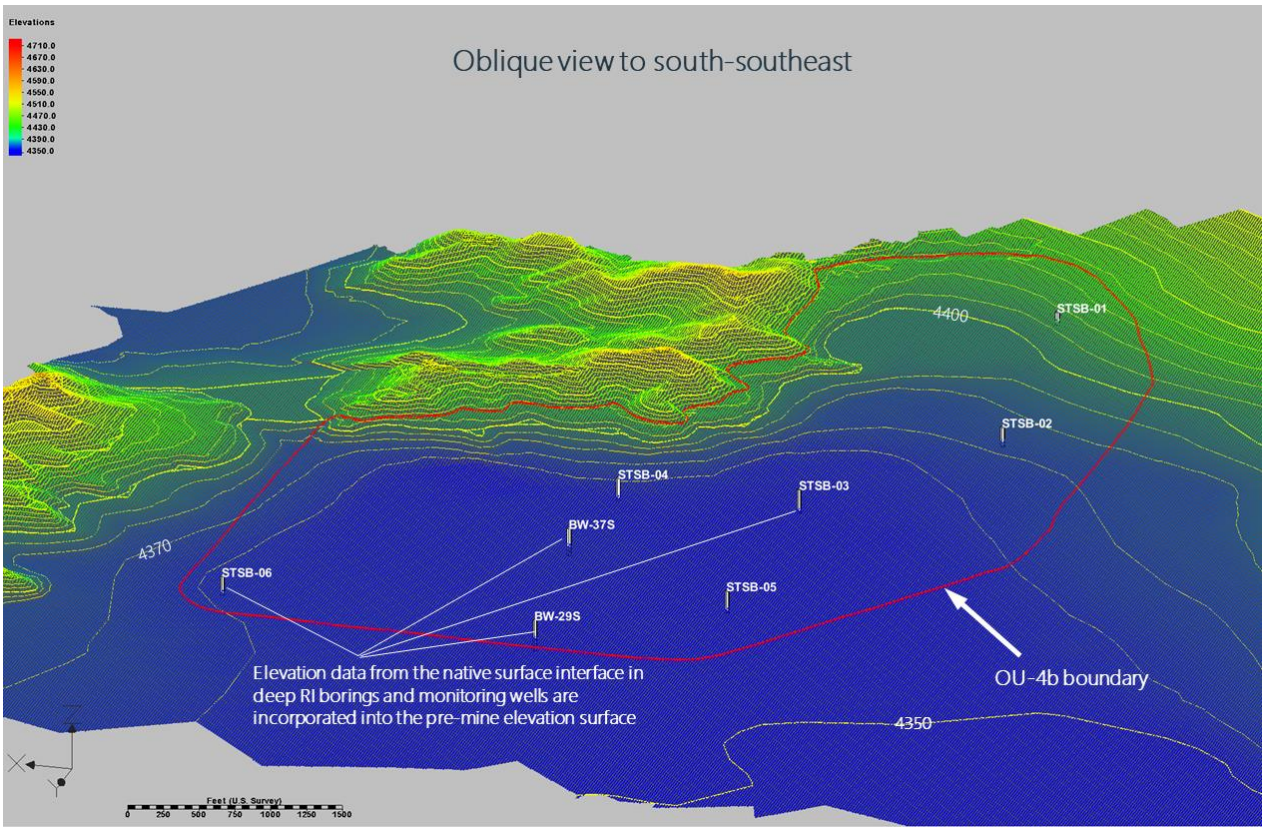

Figure 2A-1: OU-4b – Sulfide Tailings Area - Pre-mining native surface

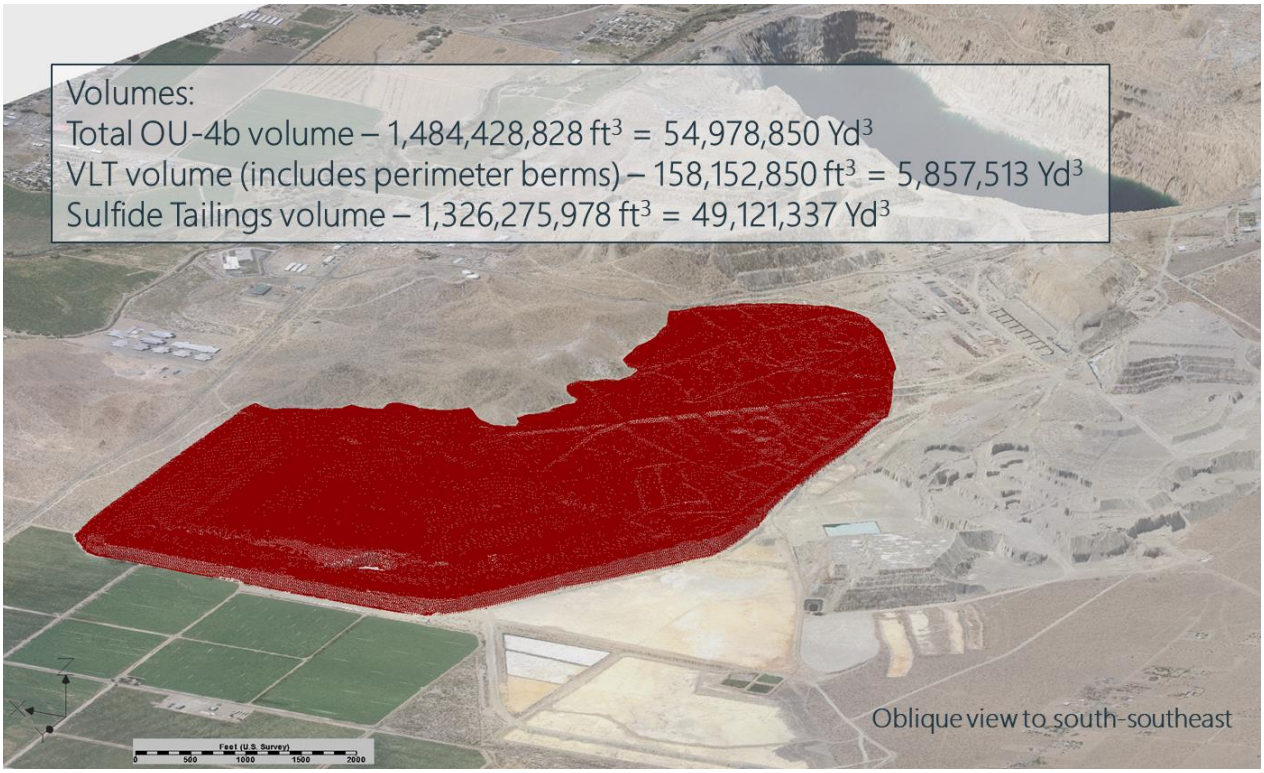

Figure 2A-2: OU-4b – Volume Calculation of Sulfide Tailings Area

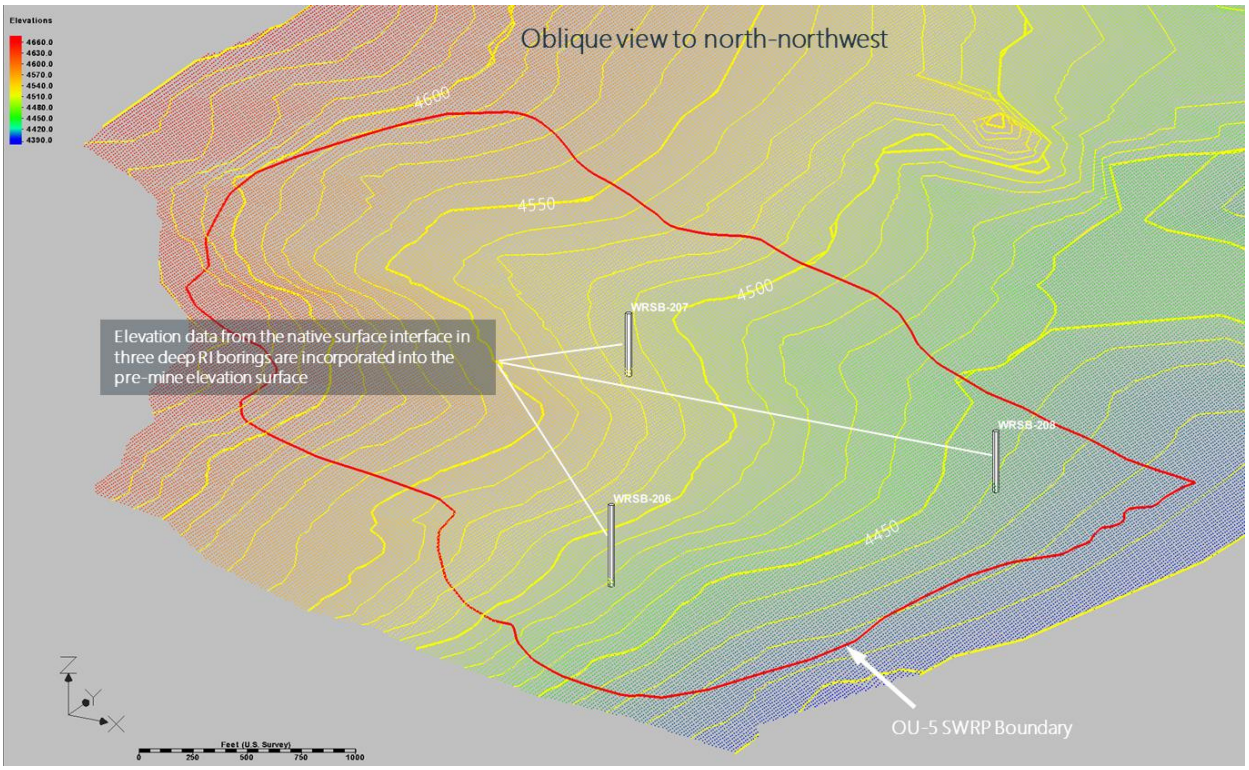

Figure 2A-3: OU-5 – South Waste Rock Area - Pre-mining native surface

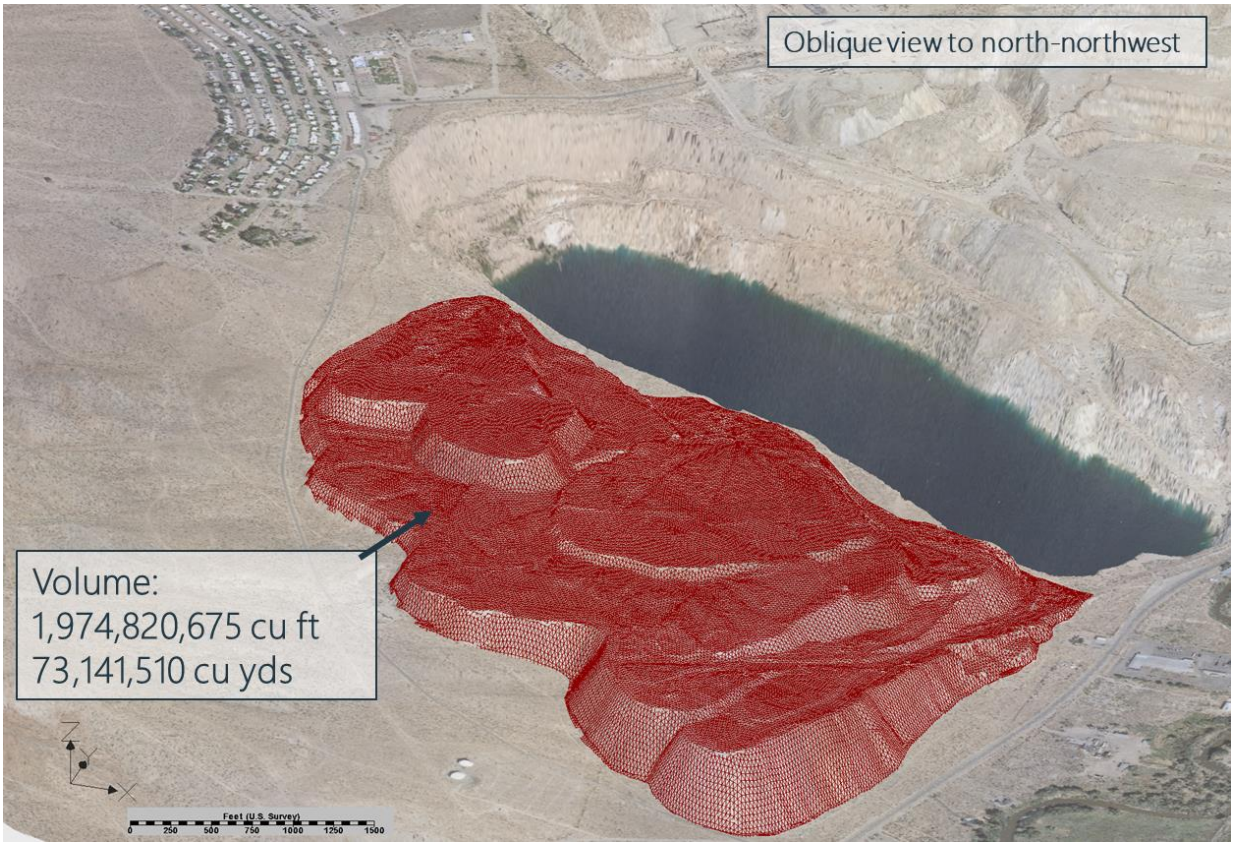

Figure 2A-4: OU-5 – Volume Calculation of South Waste Rock Area

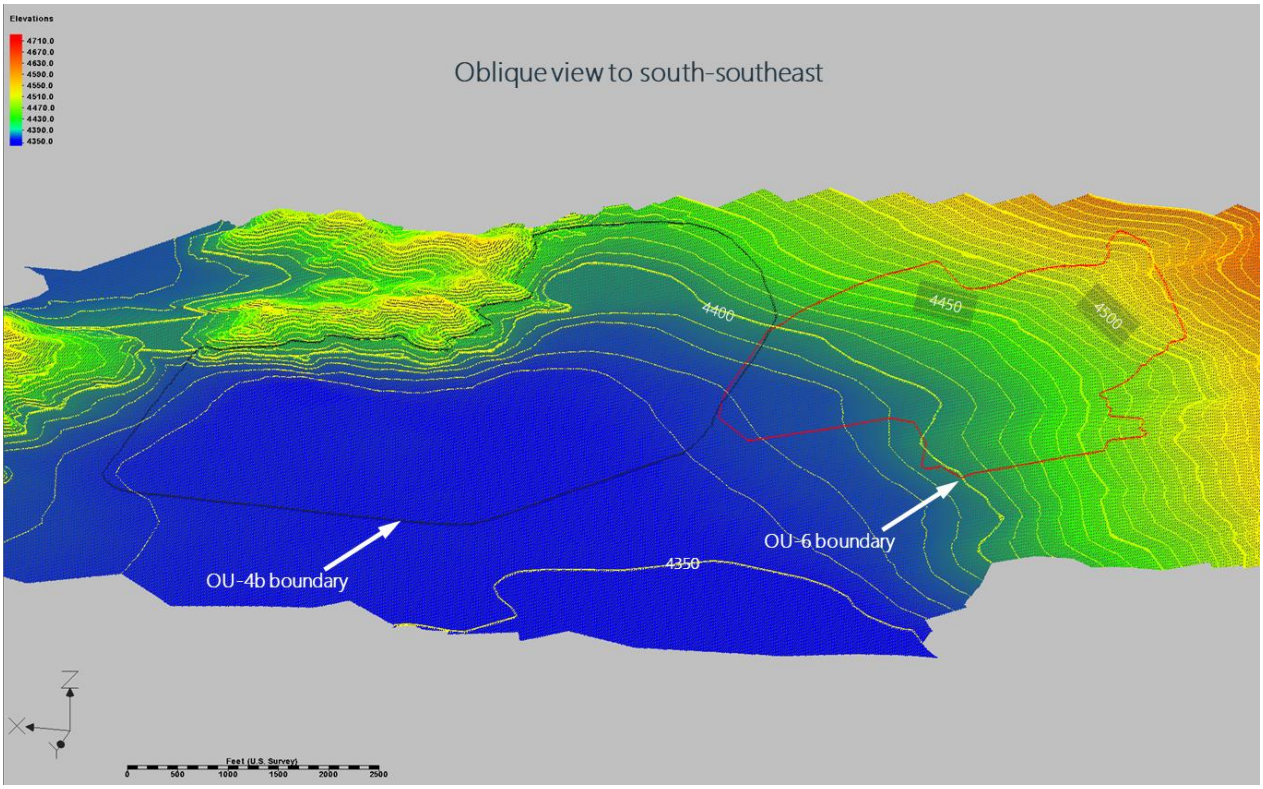

Figure 2A-5: OU-6 - VLT Pile - Pre-mining native surface

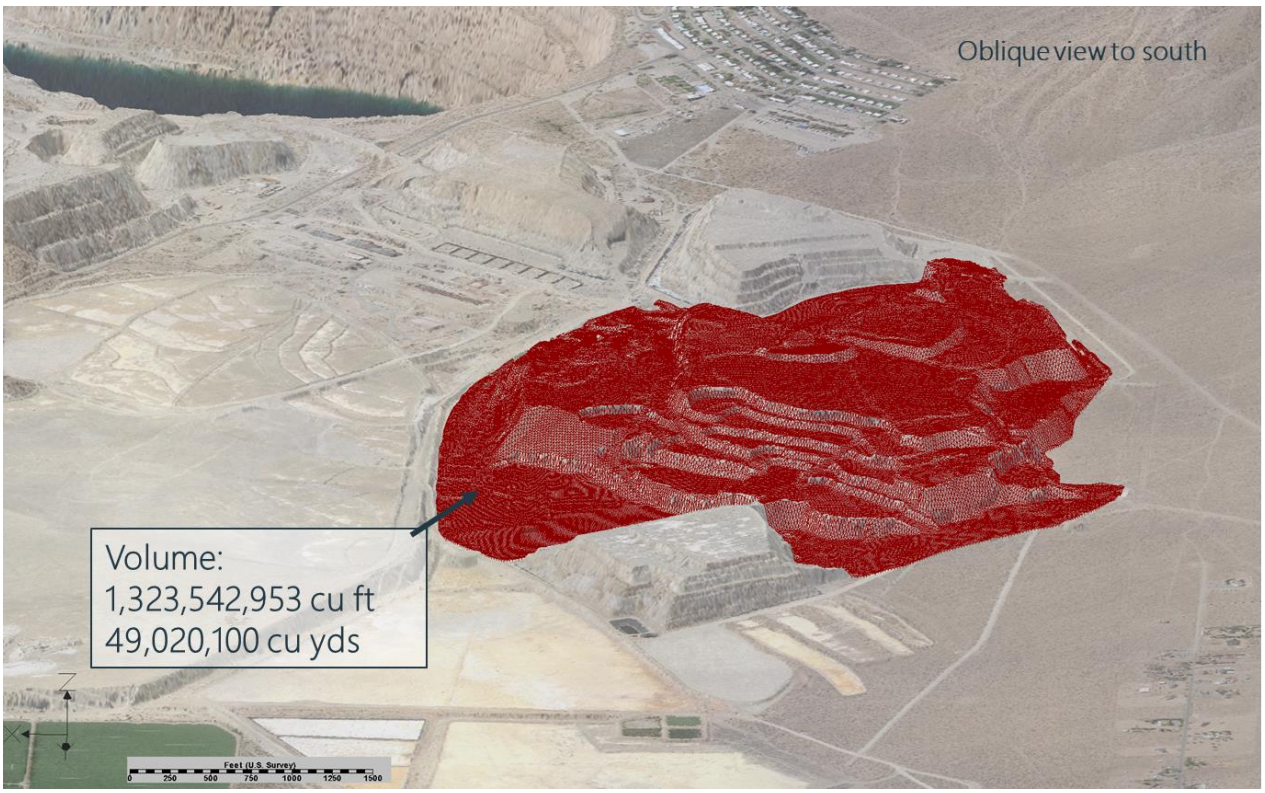

Figure 2A-6: OU-6 – Volume Calculation of VLT Pile